

User Handbook

## **HV04 - HV07 MK 3 Models (ACE)**

**Stationary Air Compressors**



ST 16048-00 Iss D 08/2007



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# 1 Introduction

## IMPORTANT !

**BEFORE INITIAL START-UP, ENSURE THAT THE COMPRESSOR IS FILLED WITH A HYDROVANE APPROVED OIL. DO NOT OVERFILL.**

## 1.1 Support

Full support is available from your CompAir Distributor. If you need any specialist help or service, please contact your Distributor quoting the MODEL TYPE and SERIAL NUMBER.

## 1.2 Customer Warranty Terms

All compressors, which are serviced by an authorised CompAir Distributor, are guaranteed for 12 months from commissioning or 18 months from the date of shipment.

The warranty excludes normal service parts, oil and wear items, dirt ingress, cleaning of filters and fluid drain devices and the tightening of electrical or other connections. Also excluded is adjustment of the Controller settings. Consequential damage of any nature is not covered by the warranty.

An 'Advance' 10 year warranty is available for approved installations, contact your CompAir Distributor for details.

## 1.3 Product Development

CompAir adopt a policy of continual product development. The information in this Handbook, whilst fully up to date when issued, may be subject to change without notice.

## 1.4 Quality Standards

CompAir UK Ltd Quality Management Systems are approved to BS EN ISO 9001.

These instructions comply with the latest European Directives regarding content and are valid for machines carrying the CE mark.

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## 1.5 Model Range

This Handbook relates to all ACE HV04 - HV07 vertical range compressors and Hypac models.

V04ACE07-4035D200	50Hz model
V04ACE10-4035D200	50Hz model
V04ACE07-4035S200	50Hz model
V04ACE10-4035S200	50Hz model
V04ACE07-2336D205	60Hz model
V04ACE10-2336D205	60Hz model
V04ACE10-2316D205	60Hz model
V04ACE07-5756D205	60Hz model
V04ACE10-5756D205	60Hz model

V05ACE07-4035D200	50Hz model
V05ACE10-4035D200	50Hz model
V05ACE07-4035S200	50Hz model
V05ACE10-4035S200	50Hz model
V05ACE07-2336D205	60Hz model
V05ACE10-2336D205	60Hz model
V05ACE10-2316D205	60Hz model
V05ACE07-5756D205	60Hz model
V05ACE10-5756D205	60Hz model

V07ACE07-4035D100	50Hz model
V07ACE10-4035D100	50Hz model
V07ACE07-4035S200	50Hz model
V07ACE10-4035S200	50Hz model
V07ACE07-2336D205	60Hz model
V07ACE10-2336D205	60Hz model
V07ACE07-4035V200	60Hz model
V07ACE07-5756D205	60Hz model
V07ACE10-5756D205	60Hz model

## 1.6 Product Terminology

The product code segments signifies:

V	Vane
04, 05, 07	kW motor
ACE	Air Centre Electronic
07, 10	Delivery pressure in bars
23	230V
40	400V
57	575V
1, 3	Single phase, 3 phase
5, 6	50 Hz, 60Hz
D, S, V	Direct On Line, Star/Delta, Variable Speed
100,200	European Specification (50 Hz)
105,205	US Specification (60 Hz)

This publication refers to compressors with serial numbers from:

V04-000920-0702	-200 first build
V05-000819-0702	-200 first build
V07-002459-0702	-200 first build



## 2 Safety

### 2.1 General Health and Safety Precautions

**Please read carefully and proceed in accordance with the following instructions before installation, operation, maintenance or repair of the compressor unit.**

### 2.2 The Health and Safety at Work Act, 1974

In order to comply with your responsibilities under the above act, it is essential that the Compressor is transported, positioned, installed, operated and maintained by competent persons in accordance with the instructions in this Handbook.

The standard build of all Hydrovane products are designed to compress clean, dry, atmospheric air and are not intended for use in either Explosive or Potentially Explosive Atmospheres as defined in the ATEX Directive 94/9/EC.

A potentially Explosive atmosphere is an atmosphere which could become explosive due to local and operational conditions.

The Compressor warranty will be invalidated if unapproved spare parts or oils are used. Using such items may cause the efficiency and service life of the Compressor to be reduced, and could create a hazardous condition over which CompAir has no control.

Failure to maintain the Compressor correctly, or modifying it without prior approval from CompAir, may also create a hazardous condition. This will also invalidate the warranty.

Read and fully understand the contents contained in the User Handbook.

Ensure that the User Handbook is not permanently removed from the Compressor.

Check that there are no signs of damage and/or oil leaks from the Compressor, cooler and associated pipework.

After completing work, tools and foreign matter should be removed from the Compressor and its surrounding area.

In the unlikely event of a Compressor fire, dry powder or carbon dioxide fire extinguishers should be used. Never use water.

### 2.3 Before Working on Compressor

Potentially dangerous voltages are used to power this machine. Do not carry out any work until the isolator is locked in the off position. Fit a safety notice to the isolator advising that work is being carried out and that the isolator must not be switched on. If in doubt, a qualified electrician may remove the fuses and keep them in a secure place until work is complete.

Ensure the Compressor has been safely isolated from the main air system and cannot be re-introduced until all work has been completed. Fit a safety notice to the isolation valve advising that work is being carried out.

Do not undertake any work until the Compressor and receiver, if fitted, have been relieved of all pressure.

Wait until the Compressor's vent down cycle is complete.

Release any pressure contained in the aftercooler or associated pipework.

Check that the Compressor pressure gauge reads zero. Do not proceed until it does.

Carefully unscrew the Compressor filler plug. If any air or oil escapes before the plug is fully removed stop! Do not remove the plug until all pressure is lost.

Safety devices fitted to the Compressor or pipework system should be checked at regular intervals and replaced if faulty. They should not be tampered with or modified. Non return valves should not be used as isolation devices.

To ensure the Compressor operates safely you must carry out the specified maintenance procedures.

Only approved oils should be used for flushing purposes.

Extreme caution should be taken if the Compressor has been subjected to severe operating temperatures or fire. Certain components may contain fluoroelastomer materials and under these conditions can leave extremely corrosive residues. Severe burns and permanent skin and tissue damage can be a result of skin contact.

The Health and Safety information contained in this Handbook is only intended to give general guidelines.

### 2.4 When Operating the Compressor

When in automatic mode the Compressor may re-start without warning.

If an automatic re-start device is fitted (allowing the Compressor to start when power is re-applied), or operation is controlled from a remote location, additional warnings will be required.

Do not remove any plugs or release pipework when the Compressor is running.

Do not attempt to open the starter enclosure while the Compressor is operating.

Beware of hot surfaces, both the Compressor and electric motor are designed to run at elevated temperatures.

Compressed air is potentially dangerous and can be fatal if misused. Do not allow compressed air jets, discharged from any pipe or nozzle, to make contact with your body.

Wear safety glasses and suitable clothing when using or working in an area where compressed air is being used.

Hazardous vapours/fumes can be produced if compressed air is used to remove chemicals, cleaning agents and oils from equipment and components. Suitable respiratory and extraction equipment may be required in these circumstances. Never use compressed air for cleaning personal clothing.

Air discharged from Compressors is unsuitable for breathing purposes. Air for human consumption must be subjected to further treatment to ensure that contaminant levels for odour and moisture content meet the requirements of BS 4275 1974.

We recommend that air supply to hand-held air guns is regulated to a lower pressure (refer to local Health and Safety regulations).

Do not insert any object or any part of your body through any opening of the Compressor enclosure. Serious personal injury and/or damage may result.

Never run the Compressor with any covers or guards missing, unless advised to do so.

## 2.5 Potential Oil Health Hazards

**This section relates to CompAir UK Ltd approved oil. For other oils refer to the Health and Safety Instructions issued with the relevant product.**

There are no significant hazards associated with this product when properly used and in the application for which it was designed. Frequent and/or prolonged skin contact may give rise to skin irritations and it is recommended that protective gloves are worn. The carcinogenic action of mineral oils should be brought to the attention of all users. \*

The oil may be hot so take care when carrying out oil changes.

Do not keep oily rags in pockets or wear contaminated clothing. Do not inhale fumes or vapours. Do not swallow. Avoid eye contact.

Always wash hands after use and before eating, drinking and smoking.

## 2.6 First Aid Measures

**Inhalation** - Remove from exposure into fresh air. If necessary give artificial respiration or oxygen. Seek medical advice.

**Skin Contact** - \*Mildly irritating. Remove by wiping. Wash with soap and water. Apply emollient cream.

**Eye Contact** - \*Mildly irritating. Flush with copious amounts of warm water. Seek medical advice if necessary.

**Ingestion** - Do not induce vomiting because of the risk of aspiration. Wash mouth out with water. Give 1/2 pint milk. Seek immediate medical attention.

### Further Medical Treatment

**Aspiration** - If there is any suspicion of aspiration into the lungs (for example during vomiting) admit to hospital immediately.

**Pressure injection** - Obtain immediate medical attention, even if injury appears minor.

**Spillage** - Soak up with absorbent clay.

**Waste Disposal** - Oil, condensate, filter elements etc. should be disposed of in accordance with local regulations. Do not allow oil to contaminate water supplies.

**\* See Cautionary Notice SHW 397 'Effects of Mineral Oil on the Skin' and MS(B) 5 'Skin Cancer Caused by Oil' published by the Health and Safety Executive.**

## 2.7 Warnings, Cautions and Notes

**WARNING !** is used in the text to identify specific hazards which can cause injury or death. This type of hazard is identified below.



Risk of electric shock



Risk of hazard or danger



Risk of hot surfaces



Eye protection must be worn



Dust protection must be worn



Warning pressurised vessel



Warning pressurised component or system



Warning unit is remotely controlled and may start without warning



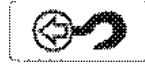
Read the instruction manual



Do not operate the machine without the guard being fitted



Warning do not start the machine without consulting Handbook



Lifting point



Direction of rotation

**CAUTION !** is used in the text to identify incorrect procedures which can cause damage to the Compressor.

**NOTE !** is used in the text to draw attention to specific points of importance.

CompAir declines all liability in the event of material damage or bodily injury resulting from negligence in the application of these precautions, from non-observation or lack of elementary supervision in respect of handling, operation, servicing or repair, even if not expressly stated in this instruction notice.



## 3 Product Information

### 3.1 Operating Temperatures

Your Compressor will give optimum performance and trouble-free service life when the bulk oil temperature is maintained between 75°C and 85°C.

Certain operating conditions sustained over a period of time may cause problems that effect the performance and reliability of this Compressor.

Problems may occur when compressors run for short periods on low air demand where they don't reach normal operating temperatures.

Prolonged use under these conditions can cause condensation build up within the Compressor and may eventually lead to emulsification of the oil.

Normal operating temperatures are reached in typically 10/15 minutes. To purge condensate from the Compressor, a longer running period with a high air demand is needed, usually a minimum of 60 minutes will be required.

Conditions or applications which prevent the Compressor temperature stabilising between these parameters should be avoided.

Consult your local CompAir Distributor if you have any particular concerns about operational characteristics of your Compressor.

### 3.2 High Operating Temperatures

Some of the reasons for high compressor oil temperatures are:

- Low oil level.
- Blocked oil cooler or cooler flow restrictions.
- Wrong type or grade of oil.
- High ambient temperature.
- Cooling fan stopped or operating incorrectly.

**Note !** The controller display will show a warning when the Compressor temperature reaches 107°C.

**Note !** The Compressor will stop automatically if the temperature rises above 110°C.

If the bulk oil temperature frequently reads 100°C, then Fluid Force HPO should be used.

### 3.3 Noise Level

Although the sound pressure level for these units is relatively low, they should be positioned where noise will not be a problem.

**3.4 Technical Data**

Model Number	HV04	HV05	HV07	HV07RS
PERFORMANCE				
F.A.D. litres/sec (cfm) @ 7 bar	11 (24)	15 (32)	21 (44)	
F.A.D. litres/sec (cfm) @ 10 bar	9 (20)	12 (25)	17 (35)	
F.A.D. litres/sec (cfm) @ 6 bar				0 - 22 (0 - 46.0)
Noise Level - dBA	66	66	67	
Power - kW (hp)	4 (5.5)	5.5 (7.5)	7.5 (10)	
Starter Type	Automatic DOL & SD			Inverter Soft Start
Drive Type	Direct			
Operating Controls	Continuous Run, Automatic Stop/Start			Variable
Rotation Speed - rev/min (60 Hz)	1450 (1760)			990 - 2220
Oil Capacity - litres				
Ambient Temperature Range °C	0 to 45			0 to 40
Maximum Relative Humidity %	85 non-condensing			
Air Discharge Temp - °C (above ambient)	<6	<8	<10	
FACTORY SETTINGS				
Minimum Pressure Valve - bar	5.5 to 6.0			
Load Pressure - bar (PL)	6.5/9.5			6.5
Unload Pressure, Max - bar (PU)	7.5/10.5			8.0
Standby Run-on-Time (secs) (Rt)	120			60
Stop Run-on-Time (secs) (St)	10			
Pressure Display Units (PD)	0 (bar) (1 = psi, 2 = kpa)			
Temperature Display Units (Td)	0 = °C (1 = °F)			
Servo Valve - bar	8.0 or 11.0			8.5
Vacuum Relief Valve	Half turn anti - clockwise			
INSTALLATION				
Air Outlet Size - Rp	¾			
Minimum Room Volume - m³	15			
Air Inlet/Outlet Area - m²	0.3			
Ventilation Rate - m³/h	2000			
Cooling Air Flow m³/h (cfm)	1850 (1089)			
Recommended Air Receiver Capacity - L	250			
COMPRESSOR OIL				
Approved compressor oil	Fluid Force Red 2000			
Oil Capacity - litres	3			
ELECTRICAL				
Starter reference 400V 50Hz DOL	34984			
Circuit diagram 400V 50hz DOL	76376			
Starter reference 400V 50Hz SD	34986			
Circuit diagram 400V 50Hz SD	76378			
Starter reference 400/460V 50/60Hz RS				34990
Circuit diagram 400/460V 50/60Hz RS				76377
Starter reference 230-575V 60Hz DOL 3PH	34982			
Circuit diagram 230-575V 60Hz DOL 3PH	76374			
Starter reference 230-575V 60Hz DOL 1PH	34983			
Circuit diagram 230-575V 60Hz DOL 1PH	76375			

See electrical data inside starter door

## 4 Transportation and Handling

### 4.1 Introduction

Lifting and transportation must only be carried out by authorised persons, fully trained in the use of the equipment employed.

Ensure that all means of transportation and/or lifting equipment are adequate for purpose and are rated to exceed the full load of the unit.

### 4.2 Lifting and handling (Fig. 4.1 and Fig. 4.2)

A fork lift or pallet truck are the most suitable means of transportation. Pay particular attention to ensure stability to prevent the unit tilting over.

Lift the Hypac or Compressor and place it in the desired location. Use the base pallet to transport the unit to the point of installation before removal. We recommend two people should carry out this operation.

Remove two bolts from the base pallet, carefully tilt the Compressor unit sideways and fit the resilient mountings to the Compressor base.

Damage to the mounting may occur if you attempt to slide the Compressor into position.

### 4.3 Weights and Dimensions

Table 4.1 shows the weights for the ACE HV04-HV07 Compressors and the Hypac range.

Dimensions are shown in Figure 4.3 and detailed in Table 4.2 for the range of units.

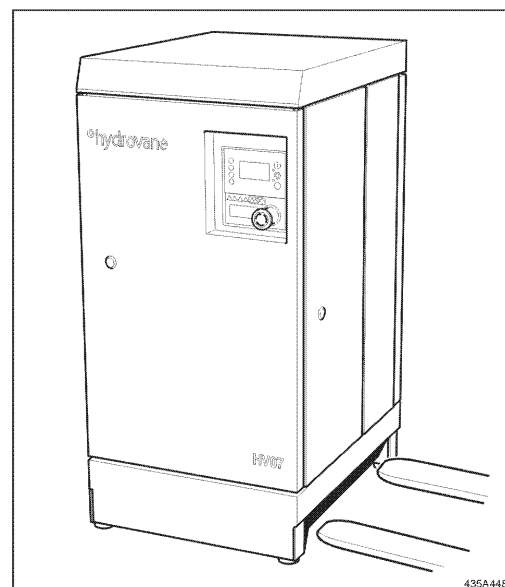


Fig. 4.1 - ACE HV04-07 Vertical Compressor

Table 4.1 - Vertical MK 2 Weights

Compressor	HV04	HV05	HV07	HV07RS
ACE	181	186	197	204
ACER	306	311	322	329
ACED	223	229	240	247
AERD	348	354	365	372

All weights in kilos

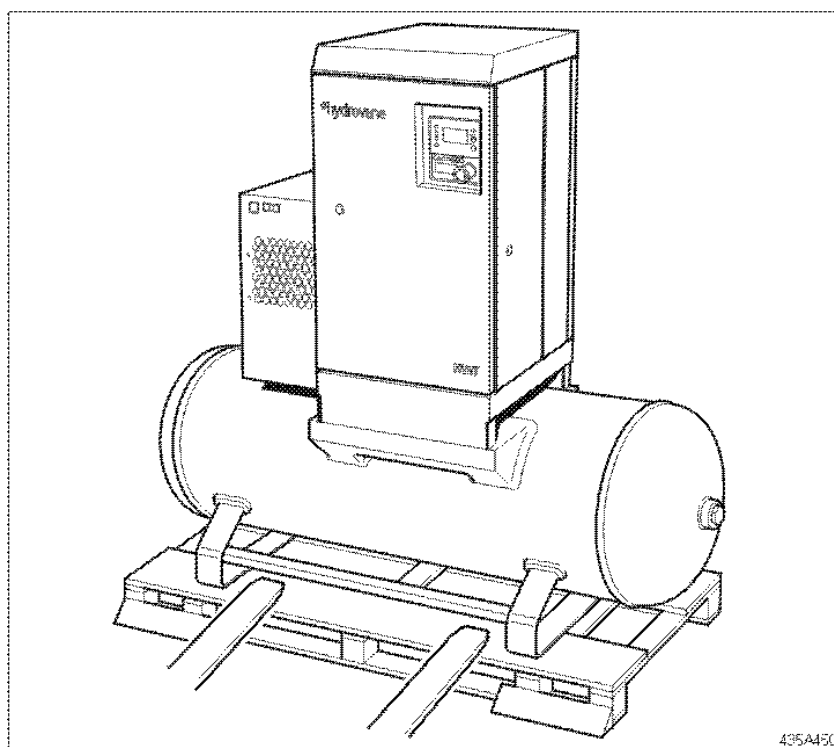


Fig. 4.2 - ACER HV04-07 Hypac Compressor

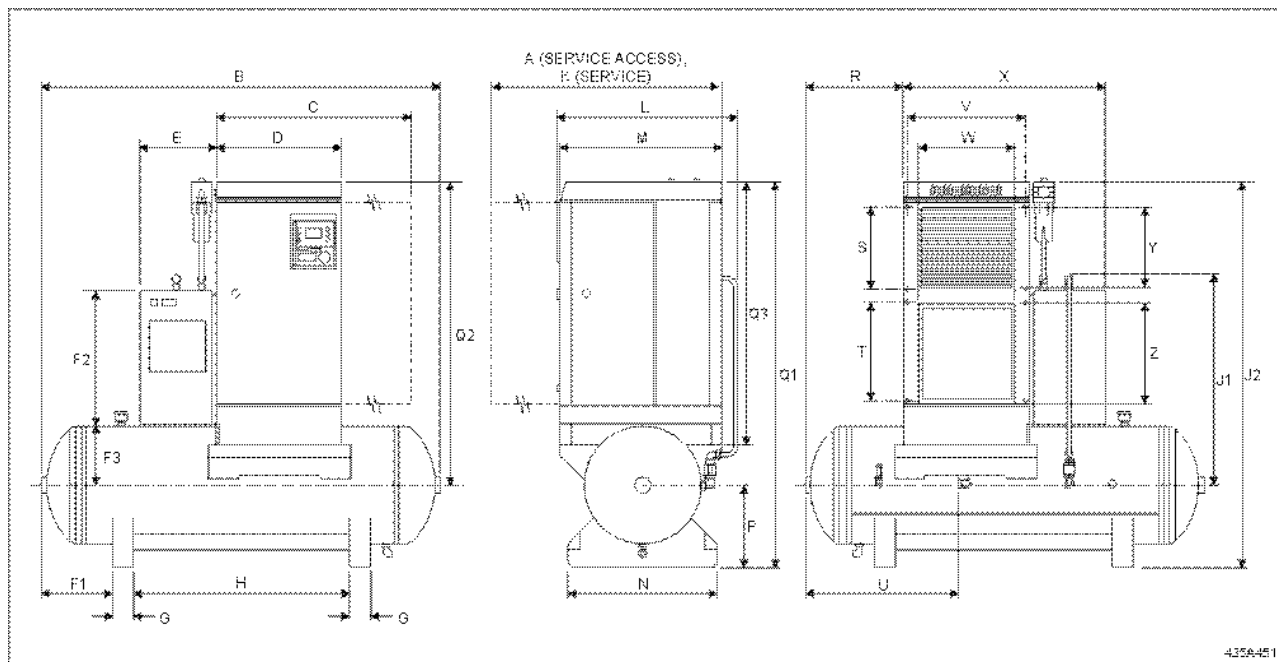


Fig. 4.3 - ACE HV04-HV07 Compressor and the Hypac Range Dimensions

Table 4.2 - ACE HV04-HV07 Compressor and the Hypac Range Dimensions

Dimensions (mm)	V04-V07	V04-V07 ACER	V04/V05 ACED	V07 ACED	V04/V05 AERD	V07 AERD
A	1133	1133	1133	1133	1133	1133
B	N/A	1570	N/A	N/A	1570	1570
C	826	826	826	826	826	826
D	500	500	500	500	500	500
E	N/A	N/A	217	302	217	302
F1	N/A	275	N/A	N/A	275	275
F2	N/A	N/A	450	525	450	525
F3	N/A	155	N/A	N/A	155	155
G	N/A	80	N/A	N/A	80	80
H	N/A	860	N/A	N/A	860	860
J1	N/A	630	N/A	N/A	630	630
J2	N/A	1514	N/A	N/A	1514	1526
K	N/A	1133	N/A	N/A	1133	1133
L	642	642	642	642	642	642
M	633	633	633	633	633	633
N	N/A	580	N/A	N/A	580	580
P	N/A	322	N/A	N/A	322	322
Q1	N/A	1514	N/A	N/A	1514	1526
Q2	N/A	1192	N/A	N/A	1192	1204
Q3	1032	1032	1032	1032	1032	1032
R	N/A	383	N/A	N/A	383	383
S	325	325	325	325	325	325
T	388	388	388	388	388	388
U	N/A	478	N/A	N/A	478	478
V	470	470	470	470	470	470
W	360	360	360	360	360	360
X	N/A	N/A	717	802	717	802
Y	315	315	315	315	315	315
Z	395	395	395	395	395	395

## 5 Installation and Commissioning

### 5.1 Positioning Your Compressor - Basic Requirements

We recommend an approved installation from an authorized CompAir distributor with a service agreement to maintain your Compressor.

Position the Compressor/Hypac in a room of adequate size on a firm surface, level in both planes within five degrees of the horizontal.

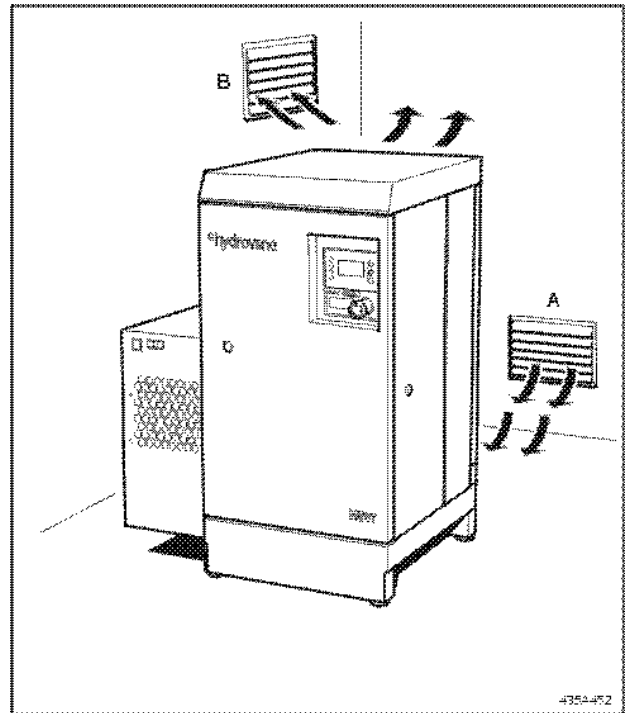
Ensure the area has sufficient load-bearing capacity, normally it is not necessary to bolt the unit down.

Sufficient access (1 metre) for all routine service procedures should be provided around the unit.

Site the Compressor/Hypac as far as possible from sources of dirt, coarse solids, abrasive particles, steam, liquids and gaseous impurities.

This is an industrial compressor and is intended for installation in an indoor environment.

Any air connection made to the Compressor outlet must be flexible as the base incorporates resilient mountings.



**Fig. 5.1 - Compressor Ventilation**

### 5.2 Ventilation (Fig. 5.1 and Fig. 5.2)

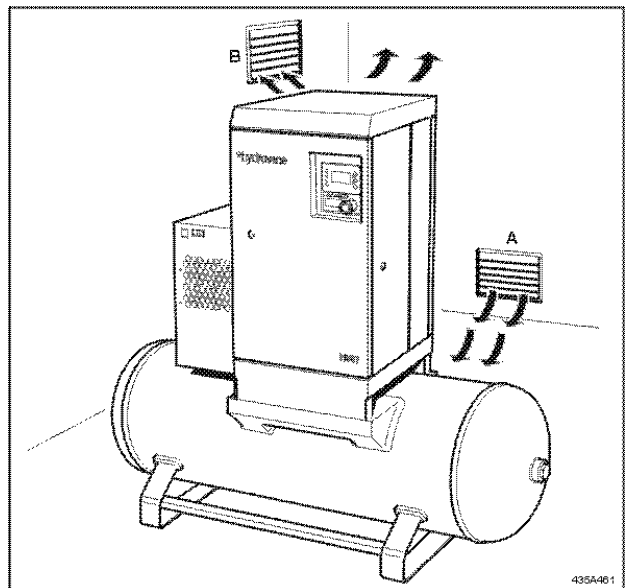
Position the Compressor/Hypac in a well ventilated location. Do not restrict the air-flow around the Compressor; allow clearance of 1 metre all around. Do not allow the hot air discharge to re-circulate into the Compressor intake.

Any cooling-air inlet (A) should be positioned low allowing unrestricted air-flow to the Compressor intake. The warm-air outlet (B) should be positioned high, and well away from the inlet, to ensure a positive cooling air-flow through the Compressor.

To achieve this, ensure the Compressor is installed in a room of the correct size and with sufficient ventilation. The Compressor must not be operated in ambient conditions other than in Section 3.4, Technical Data.

For maximum efficiency and reliability, the Compressor should be operated in a moderate ambient temperature. If temperatures frequently fall below 0°C, consult your CompAir Distributor. A different grade of oil may be required.

Air ducting, if fitted, must not cover or restrict the cooling air flow of the Compressor. Total resistance of the system must not exceed 5mm w.g. (0.2in. water gauge). If resistance is expected to be greater than 5mm w.g. then fan assistance will be required.



**Fig. 5.2 - Hypac Ventilation**



### 5.5 Check Direction of Motor Rotation

**WARNING !** 

#### **READ HEALTH AND SAFETY PRECAUTIONS BEFORE STARTING COMPRESSOR.**

Ensure that the Compressor is filled with approved oil and that all plugs are fitted securely.

The cooling fan in the rear of the unit may be used as a visual aid to determine the correct rotation of the Compressor.

To view the cooling fan, remove the cabinet filter from the lower half of the rear panel, the cooling fan can be viewed through the mesh grill.

With the mains isolator on, press the green start button mounted in the control panel. Compressor rotation is correct if the cooling fan rotates in a clockwise direction.

For single speed Compressors, if rotation is correct, the Compressor pressure display will rise immediately after starting. If rotation is not correct, the Compressor pressure display will not rise.

For RS Compressors, the rotation of the Compressors will always be correct due to the inverter drive. The cooling fan must be checked for correct clockwise rotation.

**CAUTION !** 

**If direction of rotation is incorrect, stop the Compressor immediately. Serious damage will occur if the motor is allowed to run in reverse!**

**WARNING !** 

**IF DIRECTION OF COMPRESSOR/COOLING FAN ROTATION IS INCORRECT, STOP THE COMPRESSOR AND LOCK THE ISOLATOR IN THE OFF POSITION. FIT A SAFETY NOTICE TO THE ISOLATOR ADVISING THAT WORK IS BEING CARRIED OUT ON THE COMPRESSOR.**

Open the starter door with the key provided to gain access to the starter terminals.

Change over any two of the incoming cables connected to the starter terminals L1, L2 and L3.

Close the starter enclosure door and lock with the key provided to prevent unauthorised access.

Remove the safety notice and switch the mains electricity supply on.

Restart the Compressor and verify that direction of rotation of both the Compressor and cooling fan are correct.

Replace the cabinet filter in the rear panel with the direction arrow pointing inwards towards the cooling fan.

### 5.6 Regulated Speed Compressor Installation

The Compressor should be installed generally as instructed for a standard fixed speed Compressor of the same power (kW) rating.

Electrical supply fuse sizes are the same as for standard fixed speed Compressors of the same power (kW) rating.

Alternatively, a circuit breaker (Type D) of suitable size and with motor starting characteristics may be used to protect the installation.

The maximum starting current under all starting conditions will not exceed 150% motor full load current and will generally be no more than 100% full load current.

The installation must be earthed in accordance with local regulations. The use of RCDs is not recommended.

Water drain, filters or dryers fitted downstream of the Compressor discharge must be correctly sited to avoid excessive flow restrictions to ensure stable operation of the speed control system.

### 5.7 RS Operation with Other CompAir Vane Compressors

Hydrovane RS Compressors may be operated efficiently in conjunction with other CompAir vane Compressors fitted with automatic stop-start control.

Adjust the RS target/load pressure to midway between the load/min and load/max pressure settings of the other Compressor. The RS Compressor will automatically assume the lead Compressor role after several cycles.

**IMPORTANT NOTES:** If the RS Compressor is operated with other Hydrovane standard single speed Compressors feeding a common pressure system, the maximum target/load pressure of the RS Compressor must be limited to the lowest maximum pressure of the single speed machine(s). No attempt must be made to increase the operating pressure of the single speed machine(s).

The pressure transducer sensing point is located in a valve housing adjacent to the outlet from the Compressor. If the pipework from the Compressor to the system is restricted, or prone to excessive pressure fluctuation, rapid speed changes and/or frequent stopping and starting of the motor may occur.

Should this condition arise, consult a CompAir Distributor who will arrange to re-site the pressure transducer location.





## 6 General Description

### 6.1 Compressor/Hypac (Fig. 6.1)

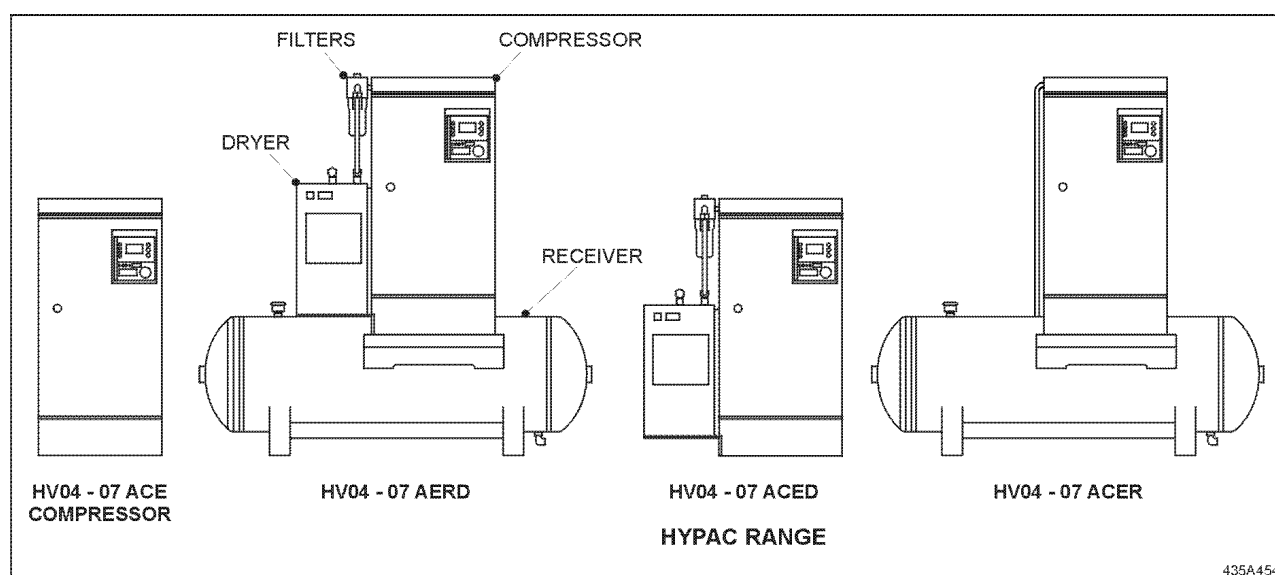
This User Manual covers the Hydrovane ACE HV04-HV07 vertical range of compressors. The Hypac range contains a compressor and either a Receiver or an air dryer or both, depending on which variant is required.

The Compressor alone is used where air demand is constant and does not exceed the output capacity of the Compressor.

An air drier is used to provide dry air (pressure dew point 3°C) for specialised applications.

A compressor plus receiver is used where air demand fluctuates, the receiver stores 250 litres of air. A drier can be combined with the compressor plus receiver for applications requiring large volumes of dry air.

Figure 6.1 shows a general view of the Hypac range. The compressor assembly is detailed in Para 6.3/Fig 6.2, the air drier is supplied with its own manual.



**Fig. 6.1 - General View - Hypac**

### 6.2 Control Systems

Compressors can be operated either in automatic Stop/Start mode or in continuous run mode.

#### Automatic Stop/Start Mode

This is the normal mode of operation giving maximum efficiency and economy. Recommended for applications with fluctuating air demands. With the auto mode selected, the Compressor will load/unload and stop/start automatically in response to air demand.

If the motor restarts more than 15 times per hour, or continually restarts within thirty seconds of stopping, then the run-on timer may be increased to reduce frequency. If after adjustment the condition persists, switch to continuous run mode.

#### Continuous Run Mode

Recommended where excessive stop/starts occur and/or when there are rapid changes of pressure in the air-line system. When the continuous run mode is selected, the Compressor will continue to supply air from full to zero flow rates.

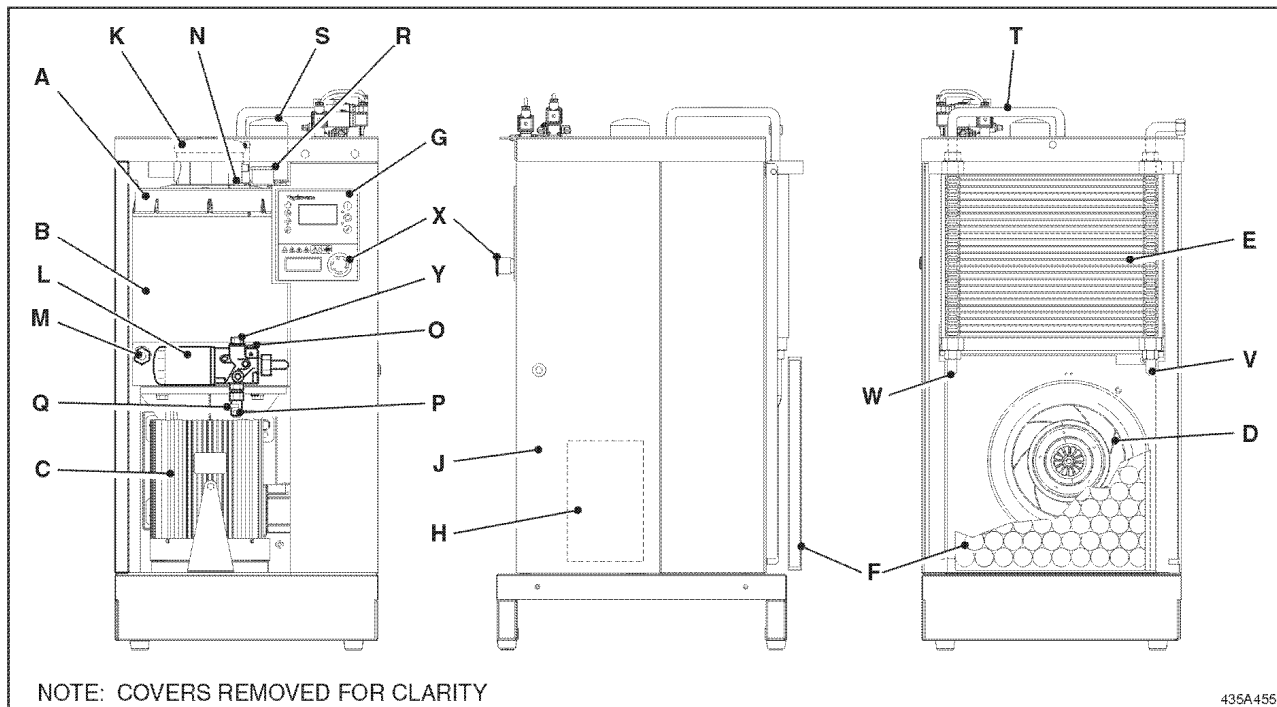
#### Regulated Speed Operation

Regulated speed compressors are automatic stop/start operation only.

The Hydrovane Regulated Speed Vane Compressor saves energy and operating cost when compared with a fixed speed compressor of similar size. The saving is achieved by automatically regulating the compressor speed to precisely match the compressor output to the system demand.

The system demand is measured and converted into an electrical signal by an integral pressure transducer. The Compressor Variable Speed Drive (VSD) unit senses the transducer signal and adjusts the electric motor speed to maintain a constant target/load pressure.

If the system pressure rises above the target/load pressure the electric motor speed will decrease, conversely, if the system pressure falls below the target/load pressure the motor speed will increase. The speed will vary between minimum and maximum limits dependent upon system demand.



**Fig. 6.2 - Compressor Assembly**

### 6.3 Compressor Assembly (Fig. 6.2)

The unit comprises of a vertical single stage, oil flooded, rotary, sliding vane Compressor driven by an electric motor mounted to a base. It is supplied with control panel, starter, and combination oil cooler/air aftercooler with all accessories piped in and electrically connected.

The intake cover (A) is assembled directly to the Compressor (B) which is fitted to the flange face of the drive motor (C). The rotor of the Compressor is mounted on the drive shaft of the motor. The motor is bolted to the vertical column supported by the base.

An electrically driven, impellor type, horizontally mounted fan (D) is located below the combination oil cooler/air aftercooler matrix (E). This draws cooling air through the air filter (F) and forces it through the cooler matrix.

The Compressor control panel (G) is mounted on the front frame, controls are accessible through an aperture in the front door panel. The controller is an electronic device with an LCD screen. An emergency stop button (X) is located on the front control panel.

For RS models, the inverter drive (H) is mounted in the starter compartment, behind the starter panel door (J).

The Compressor air intake is protected by an air intake filter (K), and the oil system is filtered by an oil filter (L). An oil level sight glass (M) is mounted adjacent to the oil filter.

The Compressor is filled and topped up with oil via the oil filler (N). The sight glass should be full with overflow from the level plug orifice (O).

Oil is drained from the Compressor and cooler by removing a drain plug (P) and opening the drain tap (Q).

The Compressor pressure gauge (R) is visible when the top panel is removed.

The oil separator (S) located on the top ensures air delivered through the minimum pressure valve has an oil cleanliness of less than 3 ppm (parts per million by weight). The air is delivered through the air delivery pipe (T) to the after cooler.

The oil supply to the cooler is through oil feed pipe (V) with the cool oil return via oil return pipe (W). For a quick warm up, a thermal by-pass valve (Y) allows the oil supply to by-pass the cooler on initial start up.

## 7 Operating Instructions

### 7.1 Operating Instructions

**WARNING !**

**READ HEALTH AND SAFETY PRECAUTIONS BEFORE YOU START ANY SERVICE WORK.**

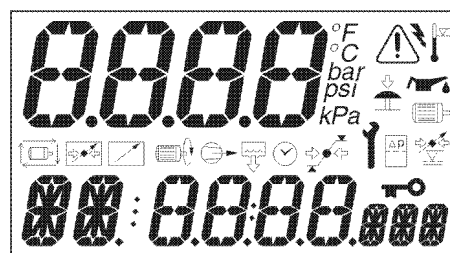
**THE COMPRESSOR SHOULD ONLY BE OPERATED BY AUTHORISED PERSONS FULLY TRAINED IN THE STARTING, STOPPING AND EMERGENCY STOP PROCEDURES.**

#### 7.1.1 Checking Procedure Before Starting

- Check sight glass is full.
- Check filler, drain/oil level plugs are fitted securely.
- Check for any signs of oil leaks.
- Check air-outlet valve is open.
- Check that the emergency stop button is released.
- Turn mains electricity supply on.

#### 7.1.2 Operating Mode

When electricity is first switched on the electronic controller (Fig 7.2) displays all symbols and illuminates both green and red LED indicators for three seconds (Fig. 7.1).



**Fig. 7.1 - Controller Display**

The display then shows the software version code for a further three seconds before showing the normal operating display

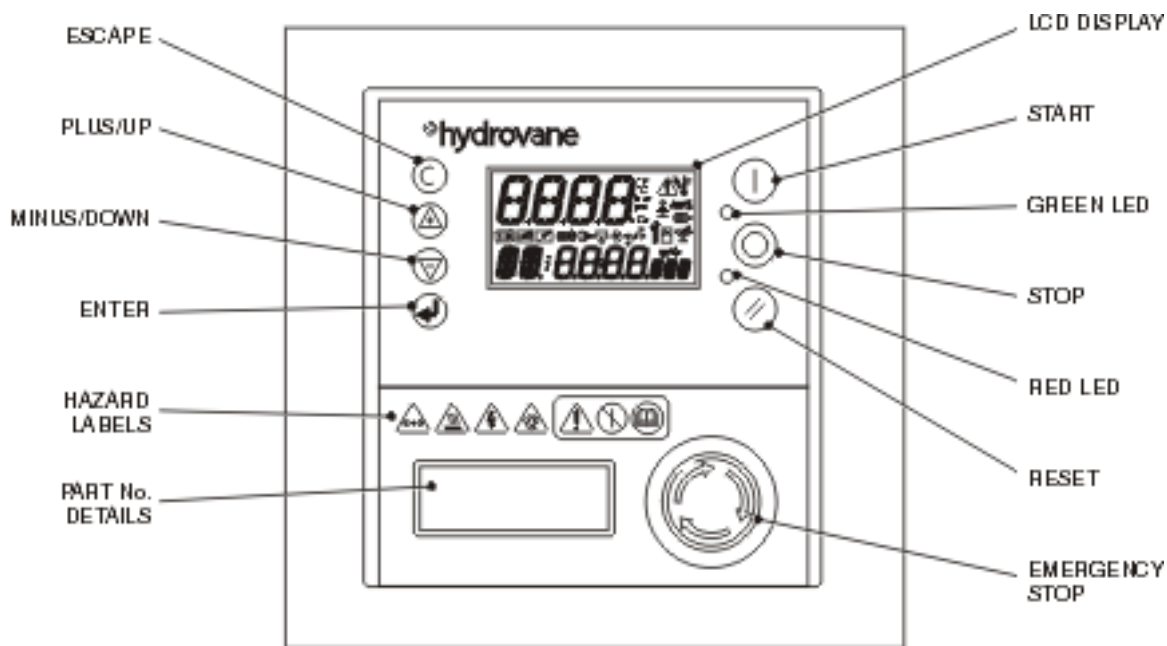
For single speed Compressors the controller allows two operating modes, automatic stop/start or continuous run.

#### 7.1.3 Compressor Operation

Automatic stop/start is set as default. For continuous running select Mo – MAN, using the touch sensitive symbol buttons on the controller panel.

Select Mo using plus up/minus down buttons, press the enter button, AUT will flash, press plus up/minus down button to change, press enter button to select.

The operating mode may be altered when the Compressor is running or stopped.



**Fig. 7.2 - Controller**

Press Plus Up/Minus Down buttons to scroll through available user menu codes P00 (view only).

- (a) Mo - Select Automatic or Manual Control
- (b) Td – RSU\* temperature (View Only)
  - \* Temperature at discharge from compression unit
  - As a default value the Td – temperature appears in the bottom of the display.
- (c) PD – Delivery Pressure (View Only)
- (d) H1 – Hours Run (View Only)
- (e) H2 – Loaded Hours (View Only)
- (f) H3 – Hours Remaining to Service (View Only)

To select and lock other menu items, scroll to the menu required, when in view press the ENTER button, a flashing key symbol is displayed.

To cancel the locked selection and flashing key symbol press the ESCAPE (C) or reset button.

During operation, the controller records the total running hours, the hours run on load and counts down to the next service interval.

The service interval is variable and is determined by the RSU temperature recorded internally by the controller.

## 7.1.4 Starting - Automatic Mode

Press the green START button. The Compressor will start if system pressure is below the load pressure set point. On initial start with no pressure in the system, the pressure display will quickly rise to the full delivery pressure. During this period, the green LED will be continuously illuminated.

The Compressor will continue to run and pressure will vary within the load/unload set points to match the system demand.

If the system demand reduces and pressure rises to the unload set point, the automatic stopping sequence will begin.

If there is a demand during run-on time, the stopping sequence is cancelled and the Compressor returns to full load running.

The run-on timer starts and the Compressor begins to unload. If there is no demand during the run-on time, the Compressor will stop in the standby state.

Automatic re-start will occur when system pressure falls to the Compressor load set point.

## 7.1.5 Starting - Continuous Mode

Press the green START button. The Compressor will start, and run continuously irrespective of either the system pressure or demand.

On initial start with no pressure in the system, the pressure display will quickly rise to the full delivery pressure. During this period, the green LED will be continuously illuminated.

The Compressor will continue to run and pressure will vary within the load/unload set points to match the system demand.

## 7.1.6 Starting - Regulated Speed

For variable speed models, the starting sequence is the same as that shown for single speed automatic mode except that, instead of the Compressor continuing to run and pressure varying within load/unload set points, the Compressor will continue to run and the speed will vary automatically to match delivery pressure at the load pressure set point to match system demand.

With no system demand when running at minimum speed the Compressor will stop at the end of the run-on time.

Automatic re-start will occur when system pressure falls to the Compressor load set point.

## 7.1.7 Stopping – All Models

To stop the Compressor, press the red STOP button.

The run-on-timer starts and the Compressor begins to unload. If there is no system demand during the run on time, the Compressor will stop.

System pressure will remain high initially, but will fall gradually with the rate of decay depending on system usage.

## 7.1.8 Emergency Stop

If an emergency occurs, press the EMERGENCY STOP button.

The button will lock in the depressed position and stop the Compressor immediately.

The red LED on the controller will flash quickly together with display symbols.

Clear any faults that may have occurred. Do not reset until it is safe to do so.

Reset the emergency stop button by twisting clockwise before re-start.

Press the RESET button on the controller to cancel the red LED and display symbols.

Operation of the emergency stop button is recorded in the controller error log.

## 7.1.9 Compressor Vent Down

Vent down is controlled automatically for all models, star delta control models have an additional rapid vent solenoid. Re-start is prevented until the vent down period is complete.

For direct on-line models, restart is prevented for a similar time period, but without the rapid vent down facility.

### 7.2 Operational Display Symbols

	Motor running		Power failure auto-restart (optional function)
	Loaded		Remote load or remote pressure regulation active
	Amount of time, timer		Remote start/stop
	Filter, differential pressure		Normal operational mode: Selected item locked as temporary default display
	Pressure set point indication (upper & lower set point indicators displayed independently)		Menu mode: Page item locked (adjustment inhibited)
	Condensate drain active (optional function)		

### 7.3 LED Indicators (Fig 7.2)

STATUS:	Green	°
FAULT	Red	I

The indicator states are shown in Table 7.1.

**Table 7.1 - Compressor Status and LED Indicators**

Compressor State	LED Status °	LED Fault I
Shutdown Error	OFF	FF
Startup Init	OFF	OFF *
Start Inhibit Check	OFF	OFF *
Start Inhibit Condition	OFF	SF
Ready to Start	OFF	OFF *
Blowdown (If Load Request) (Otherwise)	FF IF	OFF * OFF *
Standby	IF	OFF *
Start motor in Star/Delta Request (If Load Request) (Otherwise)	FF IF	OFF * OFF *
Load Delay (If Load Request) (Otherwise)	FF IF	OFF * OFF *
Load	ON	OFF *
Reload Delay (If Load Request) (Otherwise)	FF IF	OFF * OFF *
Standby Run-on-Time	IF	OFF *
Stop Run-on-Time	SF	OFF *

**Key:**

ON	Illuminated continuously
FF	Fast flash: on/off four times per second
SF	Slow flash: on/off once per second
IF	Intermittent flash: on/off every four seconds
OFF	Extinguished continuously
*	SF for alarm condition



## 8 Adjustments

### 8.1 Compressor Control (Fig. 8.1)

The Compressor controller has additional user menus, P01 for Operation and P02 for Error Log recording. The operation menu contains parameter settings that can be modified to suit system requirements.

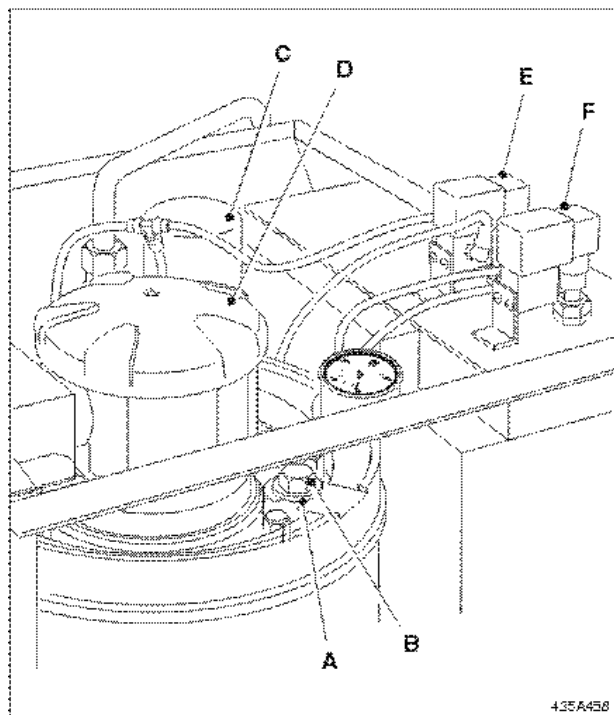
The Controller has a built-in time delay to prevent pressurised restart that inhibits the automated motor start sequence and controls the vent solenoid(s).

Solenoid valve(s) are mounted on top of the starter enclosure, on the right hand side under the top panel cover.

A single valve (E) vents down the Compressor gradually within 3 minutes after stopping.

The valve (F) will rapidly vent the compressor within 20 seconds if the starter button is pressed before gradual venting has finished.

Compressor internal pressure can only be viewed from the gauge fitted to the intake end cover.



**Fig. 8.1 - Solenoid Locations - Star/Delta Configuration**

**NOTE !** Solenoid F is not fitted to Direct-On-Line Compressors.

### 8.2 Pressure Adjustments

To alter default values in menu P01, or view error codes in P02, press the plus up/minus down buttons together on the controller, an access entry code will be displayed.

Use plus up/minus down buttons to enter zero for the first flashing character, then press ENTER. The next character flashes, repeat as before and enter zero for characters two and three, but enter nine for the final character.

With all four characters set, press either menu P01 to change parameter settings, or P02 to view error codes.

In menu P01, press plus up/minus down buttons to scroll to either Pu unload/cut-out or PL load/cut-in pressures. With Pu or PL flashing, press ENTER, the value will flash, change the value to the desired pressure and press ENTER.

All items configured within menu P01 can be changed to suit the operational parameters for a particular installation.

(a)	Pu	Unload Pressure
(b)	PL	Load Pressure
(c)	Rt	Standard Run-on-Time
(d)	St	Stop Run-on-Time
(e)	PD	Pressure Display Units
(f)	Td	Temperature display units

Press ESCAPE to initiate a display jump-back to the normal display mode, level P00 view only.


Note that during changes, if no key activity is detected for one minute, the display will automatically jump back to the normal operational display.

The error log menu P02 retains the most recently recorded fault codes and the hours when the fault occurred. The display is view only and will automatically alternate between the two values.

An explanation of the fault codes recorded is given in Section 10, Fault Finding.



### 8.3 Pressure Control – RS Compressors

**WARNING !** 

**ISOLATE THE COMPRESSOR FROM THE MAINS ELECTRICAL SUPPLY. LOCK THE ISOLATOR IN THE OFF POSITION. FIT A SAFETY NOTICE TO THE ISOLATOR ADVISING THAT WORK IS BEING CARRIED OUT ON THE COMPRESSOR.**

Compressors have factory settings for inverter speed control, target/load pressure, servo valve pressure and motor speed.

V07RS default settings are in **bold** type:

Operating pressure	<b>7.0 bar</b>	8.0	9.0	10.0
Load pressure PL	<b>6.5 bar</b>	7.5	8.5	9.5
Unload pressure Pu	<b>8.0 bar</b>	9.0	10.0	11.0
Servo pressure	<b>8.5 bar</b>	9.5	10.5	11.5

The target/load pressure may be adjusted from the 7 bar default setting in the range of 7 to 10 bar.

All four parameters must be set together as above to ensure that the compressor functions correctly.

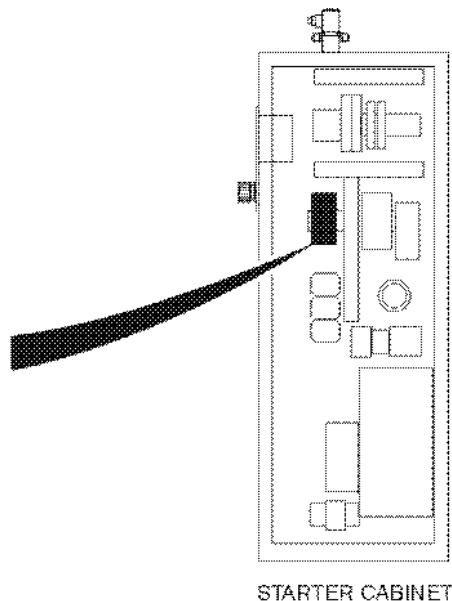
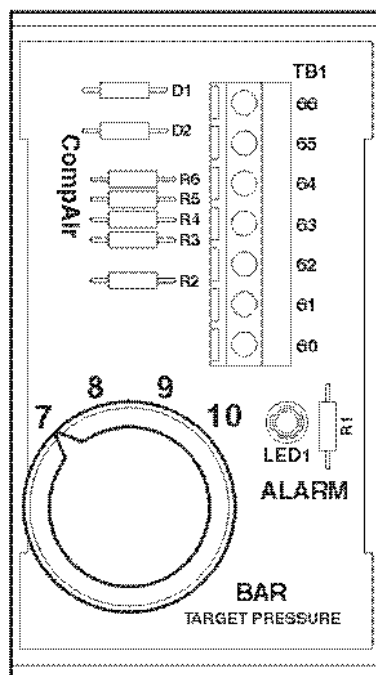
When operating at other than factory set pressures, adjustments to the Compressor servo valve pressure settings and inverter speed control unit frequency setting will be required.

A rotary selector switch (Fig. 8.2) is provided inside the starter cabinet to select the required speed and frequency settings for the inverter drive to match servo pressures that must be adjusted manually. This adjustment must be made with the supply to the compressor isolated.

On initial start-up, a warm-up time of 3-5 minutes is needed for the inverter settings to take effect.

#### USER WARNING

Compressor and inverter speed adjustments should not be attempted by the user and must be carried out by a CompAir authorised service engineer. Failure to comply with this requirement may invalidate the Compressor warranty.



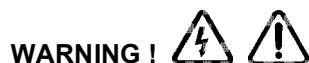
435A454

Fig. 8.2 - Starter Cabinet - Rotary Selector Switch



## 9 Servicing

### 9.1 Introduction



**WARNING !**

**READ HEALTH AND SAFETY PRECAUTIONS BEFORE YOU START ANY SERVICE WORK.**

**SERVICING OF THE COMPRESSOR MUST ONLY BE CARRIED-OUT BY AUTHORISED PERSONS FULLY TRAINED AND COMPETENT IN THE MAINTENANCE, MAINS ELECTRICAL SUPPLY AND STARTER CONTROL EQUIPMENT OF COMPAIR COMPRESSORS. THEY MUST FULLY UNDERSTAND AND ADOPT CORRECT AND SAFE WORKING PRACTICES.**

If you are unable to carry-out the work safely in the required manner, your CompAir Distributor will be pleased to help.

Use genuine CompAir parts and approved oils during routine servicing, the following premium service kits are available:

KO457EP	2000 hour/6 month, oil change kit
KM457EP	4000 hour/1 year, maintenance kit
KT457E	20000 hour/5 year, top-up kit/ full overhaul

### 9.2 Routine Service Schedule

The work listed in this section must be carried-out at the indicated running-hours, which must be regarded as a maximum. In dusty, hot or humid conditions, more frequent servicing may be necessary.

This section shows the minimum service requirements for your Compressor. To ensure that the full compressor maintenance programme is carried out, we recommend that your Compressor is regularly serviced by an authorised CompAir Distributor.

### 9.3 Servicing (RS)

Servicing intervals and procedures are the same as specified for the standard fixed speed Compressor of the same power (kW) rating.

In addition, the metal cover surrounding the speed control unit should be detached and any dirt or dust collected around the control unit ventilator fan grille removed.

The speed control unit does not require any routine servicing.

After very long periods, it is recommended that the speed control unit capacitors and cooling fan(s) be replaced to ensure continued reliability of the unit. Refer to your CompAir Distributor for details.

### 9.4 Check Compressor Operation

Assuming the Compressor is serviced correctly, the machine is capable of operating in ambient temperatures up to a maximum of 45°C. At this ambient temperature the oil temperature will be typically 85°C to 90°C.

When the Compressor is working, the temperature should be:-

Initial start-up and warm-up period. <70°C

Optimum working temperature. 75 - 85°C

High temperature. 90 -100°C

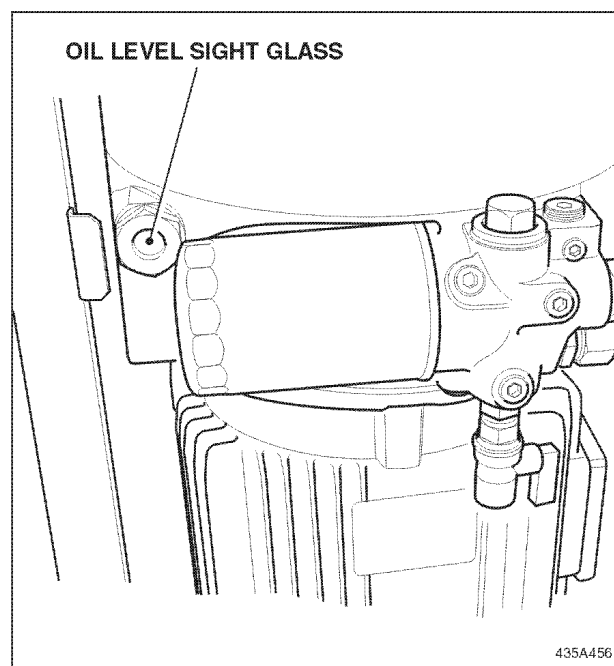
**Warning ! Consult your distributor. >107°C**

#### 9.4.1 Check Compressor Pressure

To check Compressor pressure, open the front door panel, then remove the top panel from the snap fit location pegs. Use the pressure gauge located adjacent to the air filter.

#### 9.4.2 Check oil level (Fig. 9.1)

Check the oil level using the sight-glass fitted to the Compressor near the end of the oil filter.



**Fig. 9.1 - Oil Level Sight Glass Location**

## 9.5 Basic Service

**WARNING !** 

**STOP THE COMPRESSOR AND ISOLATE IT FROM THE MAINS ELECTRICAL SUPPLY. LOCK THE ISOLATOR IN THE OFF POSITION. FIT A SAFETY NOTICE TO THE ISOLATOR ADVISING THAT WORK IS BEING CARRIED OUT ON THE COMPRESSOR.**

**CLOSE THE AIR OUTLET VALVE TO ISOLATE THE COMPRESSOR FROM THE AIRLINE SYSTEM. FIT A SAFETY NOTICE TO THE VALVE ADVISING THAT IT IS NOT TO BE OPENED.**

**DO NOT PROCEED UNTIL THE AIR PRESSURE GAUGE READS ZERO !**

**CAUTION !** 

(1) When changing recommended oil types, it is advisable to flush the Compressor.

(2) When changing to Fluid Force Clear, the Compressor must be flushed out with Fluid Force Prime.

## 9.6 Access Panel Removal

Wait until the Compressor vent down cycle is complete, vent pressure from the air aftercooler and associated pipework.

To conduct the following routine tasks, it is necessary to unlock (key provided) and open the hinged front door panel to allow removal of the top panel.

Remove the top panel from the snap fit location pegs and lift clear of the Compressor.

Check that the Compressor pressure gauge reads zero.

## 9.7 Oil Draining and Filter Replacement (Fig. 9.2 and Fig. 9.3)

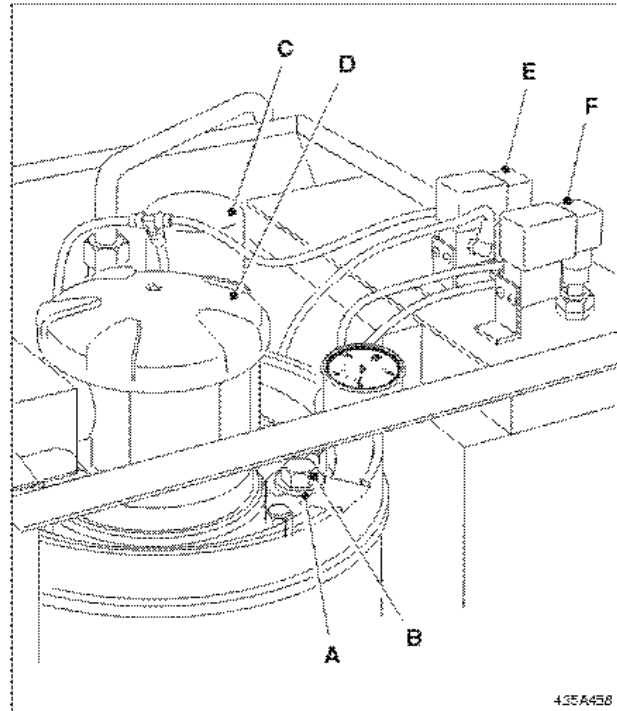
**WARNING !** 

**AVOID UNNECESSARY CONTACT WITH HOT OIL AND COMPONENTS. GLOVES ARE RECOMMENDED IF DRAINING OIL WHEN THE COMPRESSOR IS HOT!**

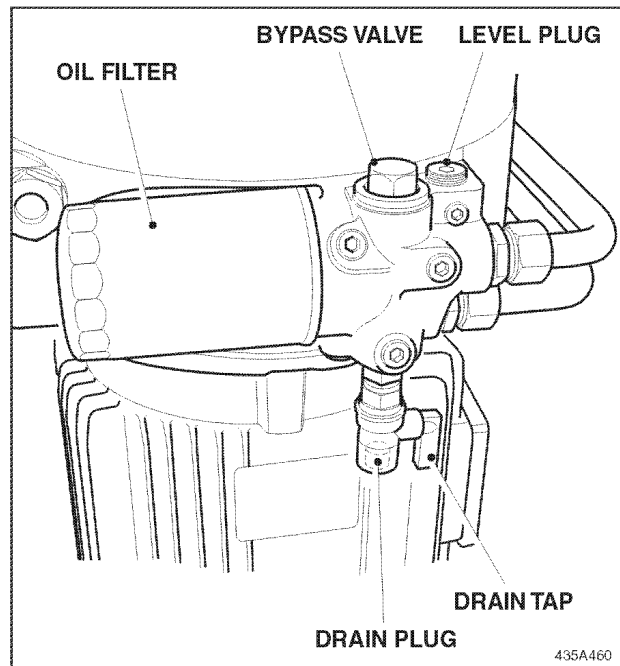
## 9.8 Oil Draining

Remove the filler plug (Fig. 9.2 (B)) and the bonded seal (A) to allow air to enter the Compressor to aid drainage.

Place a suitable container, capable of holding in excess of 3 litres, below the oil drain point. Remove the drain plug from the end of the tap (Fig. 9.3), turn the tap and allow the oil to drain.



**Fig. 9.2 - Oil Filler Plug, Air Filter and Separator Element Location**



**Fig. 9.3 - Oil Drain and Filter Location**

When draining is complete, turn the drain tap to the off position and replace the drain plug in the tap. Clean away any oil spillages.

## 9.9 Oil Filter Replacement (Fig. 9.3)

Unscrew the oil filter in an anti-clockwise direction, minimise oil spillage from the canister. Clean away any spillage and discard the old filter in a safe manner.

Using a new filter, smear a small amount of oil onto the seal, screw in clockwise to tighten, hand tight only.

### 9.10 Oil filling / Top-up (Fig. 9.3)

Remove and retain the level plug located just behind the bypass valve.

Fill the Compressor with oil until the sight glass is full. Fluid Force Red 2000 is recommended as the standard oil.

When the level is correct, oil will overflow from the level plug. Stop filling and replace the level plug. Clean away any spillage.

Refit the filler plug Fig. 9.2 (B) and bonded seal (A). Renew the bonded seal if damaged, and tighten the plug using a suitable spanner. Do not over tighten.

### 9.11 Air Filter Replacement (Fig. 9.2)

To change the air filter element, twist the cap of the air filter container (D) anti-clockwise then lift vertically to expose the element.

Remove the old element and discard in a safe manner and replace with a new element before replacing the cap.

### 9.12 Oil Separator Replacement (Fig. 9.2)

Unscrew the oil separator (C) in an anti-clockwise direction and discard in a safe manner.

Using a new separator, smear a small amount of oil onto the seal, screw clockwise to tighten, hand tight only.

### 9.13 Clean Oil Cooler/Aftercooler (Fig. 9.4)

Inspect the cooler matrix for signs of damage. If the matrix is damaged, consult your local CompAir Distributor.

The cooler matrix airflow is from the inside to outside; cleaning is best achieved by reversing the airflow to dislodge any accumulation of dirt.

Using low pressure air (2 bar), blow over the whole area of the matrix (A). To remove the rear panel it is necessary to remove two internal cap head screws at the top of the rear frame that hold the panel. Ease the rear panel away from the frame and lift it clear. Vacuum or brush the area behind the cabinet filter (B).

All discarded items and waste oil must be disposed of in an approved manner.

### 9.14 Cabinet Air Filter

This is a disposable item which is to be changed every 2000 hours. To remove the filter, slide it to one side to clear holding lugs and lift it clear. Refitting is the reverse.

### 9.15 Panel Refitting

Refit the top panel (firm push fit), close and secure the front panel door and the starter panel door (if opened). Test run the Compressor and check operation using the Controller.

If the oil filter has been replaced, run for Compressor for a short time (30 seconds) and re-check the oil level.

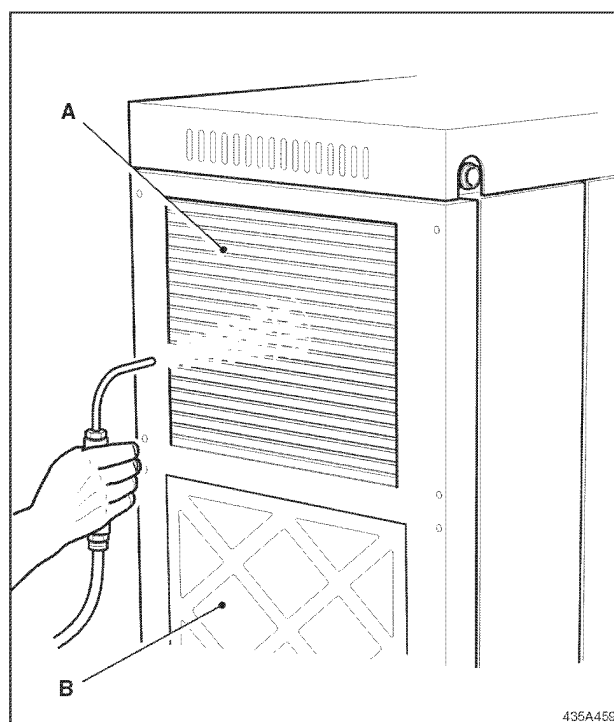


Fig. 9.4 - Matrix Cleaning

### 9.16 Electrical checks

**WARNING !**

**ISOLATE THE COMPRESSOR FROM THE MAINS ELECTRICAL SUPPLY. LOCK THE ISOLATOR IN THE OFF POSITION. FIT A SAFETY NOTICE TO THE ISOLATOR ADVISING THAT WORK IS BEING CARRIED OUT ON THE COMPRESSOR.**

Open the starter panel door with the key provided.

Remove any terminal covers fitted to contactors and incoming supply terminals.

Check for any signs of overheating and ensure that all electrical connections are tight.

Pay special attention to power connections, cables connected to contactors and incoming terminals and ensure all earthing wiring is present and undamaged.

Close the starter panel door and lock with the key provided to prevent unauthorised access.

#### 9.16.1 Clean motors

Remove any dust or dirt from motor bodies and motor air intake grill located under the Compressor base.

Remove safety notices.

## 9.17 Servicing Requirements

The following preventive maintenance charts cover all Hydrovane compressors using CompAir Fluid Force Red 2000 (Table 9.1) and CompAir Fluid Force HPO, oils (Table 9.2).

The work to be carried out must be done on or before the hours shown for this action, or every 6 months, whichever is soonest.

Service Tables 9.1 & 9.2 are shown in entirety, shaded items are CompAir Distributor maintenance tasks only.

### **READ HEALTH AND SAFETY PRECAUTIONS BEFORE STARTING ANY WORK.**

## 9.18 Service Schedule: Fluid Force Red 2000 (2000 hour oil change)

The bulk oil temperature must not exceed 100°C. If the oil is working above this temperature, the oil life will be reduced.

When changing to Fluid Force Clear the Compressor must be flushed out with Fluid Force Prime in order to comply with USDA H1 standard.

The service life of the air filter and cabinet filter are an indication only, actual life durability will depend on the operating conditions.

Additional kits available for full product support are as follows:

KF457E	2000 hour/6 month, cabinet filter kit
KSVDOL	8000 hour/2 year, solenoid valve kit
KSVSD	8000 hour/2 year, solenoid valve kit
KE457EDOL	20000 hour/5 year electrical kit
KE457ESD	20000 hour/5 year electrical kit
KE457ERS	20000 hour/5 year electrical kit
KW457E	20000 hour/5 year wear sleeve kit
KBH132	20000 hour/5 year motor bearing kit HV04
KBV132	20000 hour/5 year motor bearing kit HV05/07

Table 9.1 - Preventative Maintenance Schedule Fluid Force Red 2000.

Maintenance Actions	Install	Daily	Weekly	Every 2000 hrs	Every 4000 hrs	Every 20000 hrs
Site-sufficient access for service	X					
Site-protected from weather	X					
Site-adequate ventilation	X	X	X	X	X	X
Site-ambient temperature within limit	X	X	X	X	X	X
Site-dust free ambient	X	X	X	X	X	X
Check/torque electrical connections	X			X	X	X
Check oil level filter at plug/sight glass	X	X	X	X	X	X
Check correct drive rotation	X					X
Check for air leaks	X		X	X	X	X
Check for oil leaks	X		X	X	X	X
Check air intake filter/clean as necessary	X		X			
Check power on-load	X			X	X	X
Check power off-load	X			X	X	X
Check oil temperature	X		X	X	X	X
Check RSU temperature	X		X	X	X	X
Check servo pressure off-load	X			X	X	X
Check motor gland/cables secure	X			X	X	X
Check motor for damage	X			X	X	X
Check motor for loose connections	X			X	X	X
Check motor cables and earth	X			X	X	X
Check motor for vibration	X			X	X	X
Check flexible oil pipes				X		
Check oil seal for leakage				X	X	
Check drive media						X
Check starter contactors					X	
Check motor insulation resistance						X
Check combi cooler matrix			X	X	X	X
Clean any external dirt from Compressor	X		X	X	X	X
Clean any external dirt from motor	X		X	X	X	X
Clean cabinet filter			X			
Clean solenoids				X	X	X
Change separator element					X	X
Change 2000 hour oil				X	X	X
Change oil filter				X	X	X
Change air intake filter				X	X	X
Change cabinet filter				X	X	X
Change unloader valve seals					X	X
Change MPV seals					X	X
Change vacuum valve seals					X	X
Change flexible pipes					X	X
Change thermal motor					X	X
Grease motor bearings					X	
Full air end inspection (internal)						X
Clean servo filter						X
Change drive media						X
Change oil seal						X
Change pressure gauge						X
Change motor bearings						X
Full operational test/check	X			X	X	X
Filter element fitted to Hypac units only					X	

**Table 9.2 - Preventative Maintenance Schedule Fluid Force HPO**

Maintenance Actions	Install	Daily	Weekly	Every 4000 hrs	Every 20000 hrs
Site-sufficient access for service	X				
Site-protected from weather	X				
Site-adequate ventilation	X	X	X	X	X
Site-ambient temperature within limit	X	X	X	X	X
Site-dust free ambient	X	X	X	X	X
Check/torque electrical connections	X			X	X
Check oil level filter at plug/sight glass	X	X	X	X	X
Check correct drive rotation	X				X
Check for air leaks	X		X	X	X
Check for oil leaks	X		X	X	X
Check air intake filter/clean as necessary	X		X		
Check power on-load	X			X	X
Check power off-load	X			X	X
Check oil temperature	X		X	X	X
Check RSU temperature	X		X	X	X
Check servo pressure off-load	X			X	X
Check motor gland/cables secure	X			X	X
Check motor for damage	X			X	X
Check motor for loose connections	X			X	X
Check motor cables and earth	X			X	X
Check motor for vibration	X			X	X
Check flexible pipes				X	
Check oil seal for leakage				X	
Check drive media				X	X
Check starter contactors				X	
Check motor insulation resistance					X
Check combi cooler matrix			X	X	X
Clean any external dirt from Compressor	X		X	X	X
Clean any external dirt from motor	X		X	X	X
Clean cabinet filter			X		
Clean solenoids				X	X
Change separator element				X	X
Change 4000 hour oil				X	X
Change oil filter				X	X
Change air intake filter				X	X
Change cabinet filter				X	X
Change unloader valve seals				X	X
Change MPV seals				X	X
Change vacuum valve seals				X	X
Change flexible pipes				X	X
Change thermal motor				X	X
Grease motor bearings				X	
Full air end inspection (internal)					X
Clean servo filter					X
Change drive media					X
Change oil seal					X
Change pressure gauge					X
Change motor bearings					X
Full operational test/check	X			X	X
Filter element fitted to Hypac units only				X	

## 10 Fault Finding

### 10.1 Fault Finding

#### **WARNING !**

The Controller sequential logic monitors and checks the Compressor status through all stages of the operational cycle. At each stage, the configuration and parameter limits set within the Controller must be met for continued safe operation of the Compressor.

If faults occur they appear on the Controller display with a specific code, the last character, E, A or R, identifies the fault type.

### 10.2 Shutdown Trip Error (E) – Menu P03

A shutdown error stops the Compressor immediately or by normal stopping sequence, preventing damage or a hazardous condition. The error condition must be located and corrected, press reset to cancel the error before automatic reset will occur and the can Compressor can restart. Immediate shutdown error codes have a first character of 0, normal stopping sequence records 1 as the first character.

Er 0010 E	Emergency stop
Er 0030 E	Motor overload tripped (if fitted)
Er 0080 E	Motor fault (fault relay contact, overload device contact or thermistor)
Er 0115 E	Delivery pressure sensor fault
Er 0119 E	Delivery pressure high
Er 0125 E	Delivery temperature sensor fault
Er 0129 E	Delivery temperature high
Er 0821 E	Low resistance, short circuit/short circuit to earth condition, cable or sensor fault
Er 0836 E	Controller internal error
Er 0846 E	Delivery pressure sensor range set too low for default pressure settings to be applied

### 10.3 Alarm (A) – Menu P04

Alarms occur as a warning when normal operating conditions are exceeded, but will not stop the Compressor from being started and run. General alarm codes start with a first character of 2, service alarms begin with 4.

Er 2118 A	Delivery pressure high
Er 2128 A	Delivery temperature high
Er 2816 A	Power failure in start mode

A service timer counts down from set values until a routine service is due at 0 that sets off an alarm. A negative value count continues until the timer is reset by maintenance personnel after the required service.

Er 4804 A	Service hours time expired, service due (reset service hours countdown timer)
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### 10.4 Run Inhibit (R) – Menu P05

A run inhibit will prevent motor start until the fault is located and corrected. With normal operational status restored, press reset to cancel the error.

Er 3123 R	RSU delivery temperature (Td) below the set temperature run inhibit level.  Controller allows motor start when temperature increases above the set level.  Fluid Force 2000 is set at - 5°C Fluid Force HPO has a value of -15°C.
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Further menus with restricted access codes are intended for service level activities 1 and 2. These are reserved for use by fully trained CompAir authorised service engineers.

We strongly advise that no attempt is made to access these structures, continued safe operation may be impaired and/or serious damage may occur.

### 10.5 Fault Display Symbols

	General fault
	Emergency stop
	Excess pressure
	Power failure
	Above set temperature limit
	Lubrication, oil, oil level
	Dewpoint
	Motor
	Service due, maintenance
	Filter differential, filter service

### 10.6 Diagnostic Menu P06

The menu structure allows a technician to check and test all the inputs and outputs to the Controller individually without running the Compressor.

### **10.7 Configuration Menu P07**

Basic operating configuration settings are applied to the Compressor that control starting characteristics and pressure load and unload features with associated time delays

### **10.8 Speed Regulation Menu P08**

This function provides P & I loop control for a variable speed drive in order to maintain a steady target/load pressure.

### **10.9 Calibration Menu P09**

Pressure sensors must be set to atmospheric pressure with the Controller pressure display set to zero. Range calibration must be accurately applied to achieve correct performance and pressure related safety functions.

### **10.10 Access Level Configuration Menu P10**

Special functions and settings that determine Compressor specific configuration generally set once during factory default settings and site commissioning.

If, for any reason, you feel unsure about any fault rectification, or indeed any service aspect relating to your Hydrovane Compressor, please contact your nearest CompAir Distributor.





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